# PROJECT REPORT

*on*

# *Web Based 2-D Game*

*(CSE IV Semester Mini project PCS-404)*

*2020-2021*

***Submitted to:***

*Mr. Chandradeep Bhatt*

*(CC-CSE-B-IV-Sem)*

***Guided by:***

*Mr. Avnish Panwar*

*(Resource Person)*

***Submitted by:***

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*Roll. No.: 1918910*

*CSE-B-IV-Sem*

*Session: 2020-2021*

**DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY**

**GRAPHIC ERA HILL UNVERSITY, DEHRADUN**

# CERTIFICATE

Certified that Mr. Rishabh Negi (Roll No.- 1918910) has developed mini project on “Web based 2-D Game” for the CSE IV Semester Mini Project Lab (PCS-404) in Graphic Era Hill University, Dehradun. The project carried out by Students is their own work as best of my knowledge.

Date:21/5/2021

(Mr. Chandradeep Bhatt)
**Class Co-ordinator**
**CSE-B-IV-Sem**
(CSE Department)
GEHU Dehradun

(Mr. Avnish Panwar)
**Project Guide**
Resource Person
(CSE Department)
GEHU Dehradun

# ACKNOWLEDGMENT

We would like to express our gratitude to Lord Krishan, the most Beneficent and the most Merciful, for completion of project.

We wish to thank our parents for their continuing support and encouragement. We also wish to thank them for providing us with the opportunity to reach this far in our studies.

We would like to thank particularly our project Co-ordinator Mr. Chandradeep Bhatt and our Project Guide Mr. Avnish Panwar for his patience, support and encouragement throughout the completion of this project and having faith in us.

At last but not the least We greatly indebted to all other persons who directly or indirectly helped us during this work.

**Mr. Rishabh Negi**
**Roll No.- 1918910**
**CSE-B-IV-Sem**
**Session: 2020-2021**
**GEHU, Dehradun**

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# LIST OF ABBREVIATIONS/ACRONYMS

| | |
|---|---|
| HTML | Hyper text Markup language |
| CSS | Casacding Styling Sheets |
| JS | Javascript |

-------------------------As per your Project---------------------------

# CHAPTER 1

# INTRODUCTION

## 1.1 About Project

In this Mini-Project I have Created a website about has a Home page and a GAME PAGE, the first page consistes information about myself , my hobbies and interests , this page also include a Game page Link which leads to another page that is my game page, There I have created a very simple and easily palayable game which among the the peers is usually known as “ping-pong game” ,

This is my first website so I have tried to keep it simple.

## 1.2 HTML

HTML is at the core of every web page, regardless the complexity of a site or number of technologies involved. It's an essential skill for any web professional. It's the starting point for anyone learning how to create content for the web. And, luckily for us, it's surprisingly easy to learn.

### *How does HTML work?*

HTML stands for HyperText Markup Language. "Markup language" means that, rather than using a programming language to perform functions, HTML uses tags to identify different types of content and the purposes they each serve to the webpage.

## 1.3 CSS

The key to understanding how CSS works is to imagine that there is an invisible box around every HTML element.

CSS stands for Cascading Style Sheets. This programming language dictates how the HTML elements of a website should actually appear on the frontend of the page.

*HTML vs CSS*

HTML provides the raw tools needed to structure content on a website. CSS, on the other hand, helps to style this content so it appears to the user the way it was intended to be seen. These languages are kept separate to ensure websites are built correctly before they're reformatted.

**If HTML is the drywall, CSS is the paint.**

Whereas HTML was the basic structure of your website, CSS is what gives your entire website its style. Those slick colors, interesting fonts, and background images? All thanks to CSS. This language affects the entire mood and tone of a web page, making it an incredibly powerful tool -- and an important skill for web developers to learn. It's also what allows websites to adapt to different screen sizes and device types.

## 1.4 WEB DESIGN

The web design process starts with a visual concept, which you could sketch by hand or with software like Photoshop. Then, you use HTML and CSS to build the website. HTML and CSS are the codes for writing web pages. HTML handles the basic structure and ‘bones’ of your page, while CSS handles the style and appearance.

If you’re a good web designer, you’ll also pay attention to concepts like responsive design, aesthetics, usability and accessibility when building your site.

## 1.5 JAVASCRIPT

JavaScript is a more complicated language than HTML or CSS, and it wasn't released in beta form until 1995. Nowadays, JavaScript is supported by all modern web browsers and is used on almost every site on the web for more powerful and complex functionality.

*What is JavaScript used for?*

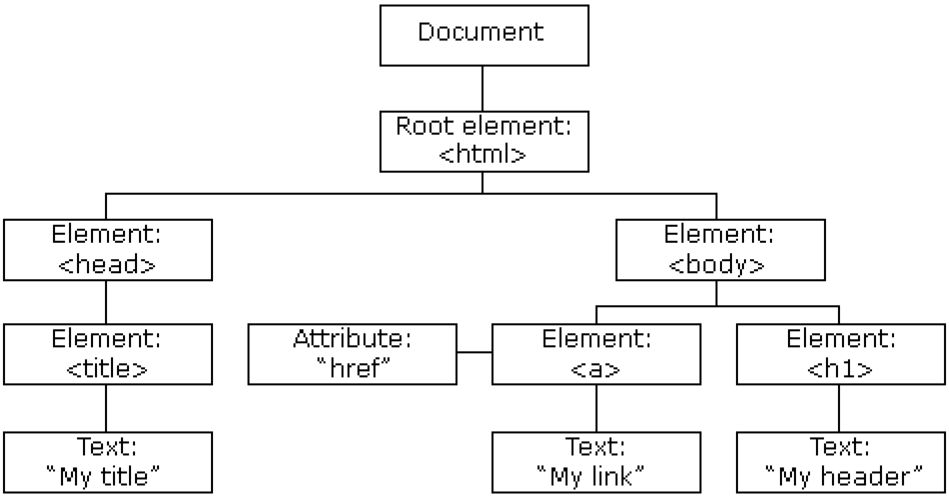
JavaScript is a logic-based programming language that can be used to modify website content and make it behave in different ways in response to a user's actions. Common uses for JavaScript include confirmation boxes, calls-to-action, and adding new identities to existing information.

In short, JavaScript is a programming language that lets web developers design interactive sites. Most of the dynamic behavior you'll see on a web page is thanks to JavaScript, which augments a browser's default controls and behaviors.

## 1.6 DOM Manipulation

At the most basic level, a website consists of an HTML and CSS document. The browser creates a representation of the document known as Document Object Model (DOM). This document enables Javascript to access and manipulate the elements and styles of a website. The model is built in a tree structure of objects and defines:

- HTML elements as objects
- Properties and events of the HTML elements
- Methods to access the HTML elements



# CHAPTER-2

# PROJECT

## 2.1 REQUIREMENT ANALYSIS

**Hardware Requirement**

1. processor i3 (min)
2. Ram 4 GB, 8 GB for best performance.
3. Graphic 2GB.
4. Hard disk  500 GB.
5. Motherboard which support above configuration.

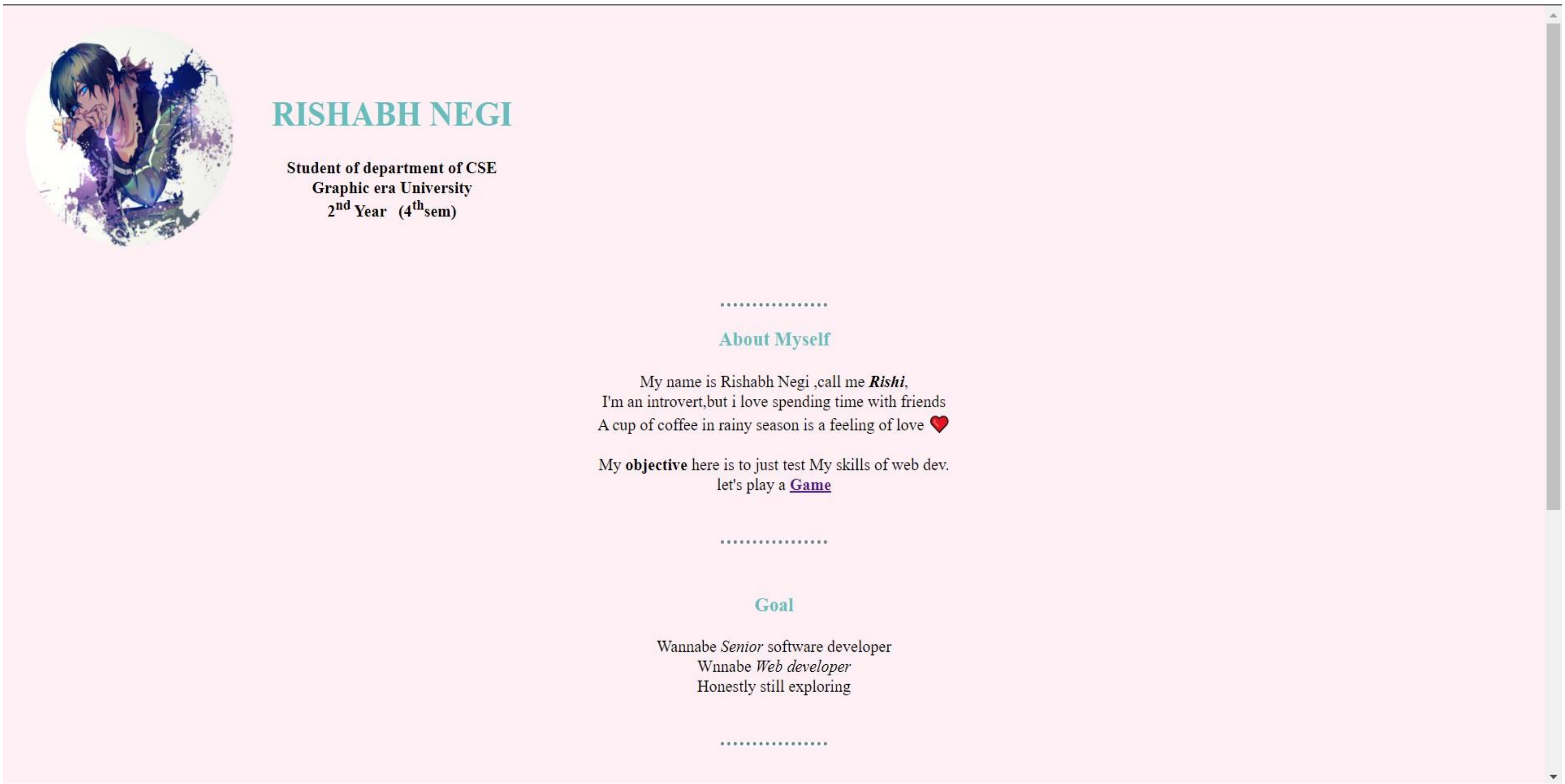
**Software Requirement**

1. OS window 10, XP, 7 , 8 any but prefer window 10 64 bit version.
2. web development: HTML5, CSS3, JS
3. Visual Studio

# CHAPTER 3

# SNAPSHOT OF PROJECT

## 3.1 Home Page Snap



RISHABH NEGI

**Student of department of CSE**
**Graphic era University**
**2nd Year (4thsem)**

................

About Myself

My name is Rishabh Negi ,call me ***Rishi***,
I'm an introvert,but i love spending time with friends
A cup of coffee in rainy season is a feeling of love ❤

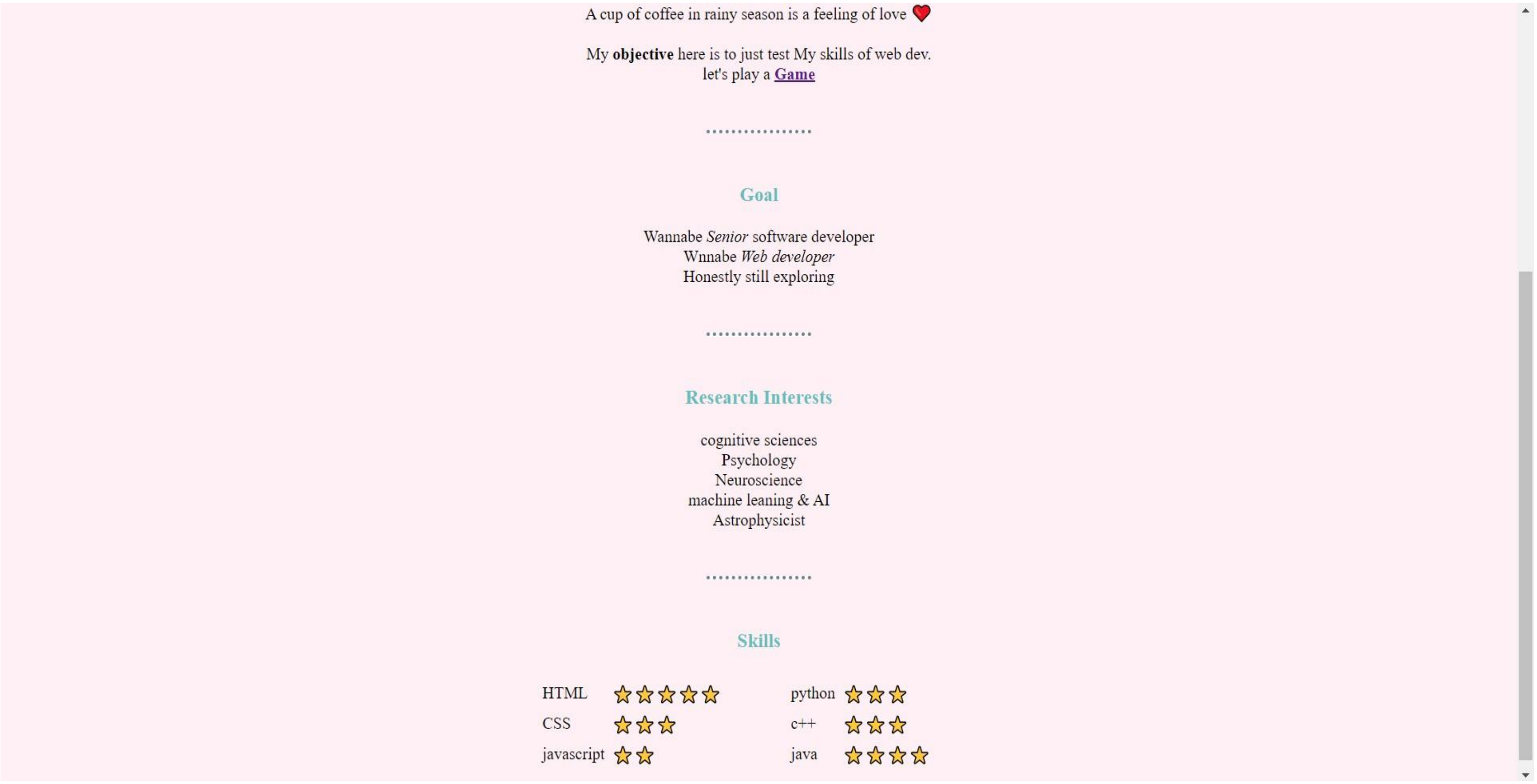
My **objective** here is to just test My skills of web dev.
let's play a **Game**

................

Goal

Wannabe *Senior* software developer
Wnnabe *Web developer*
Honestly still exploring

................



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Honestly still exploring

................

Research Interests

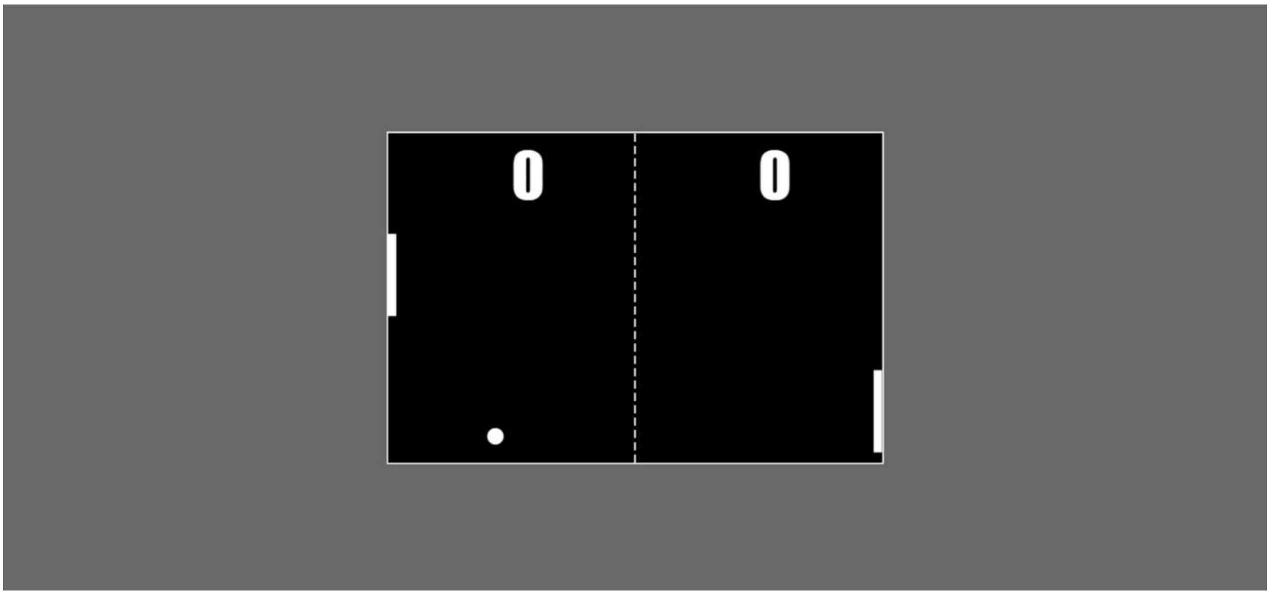
cognitive sciences
Psychology
Neuroscience
machine leaning & AI
Astrophysicist

................

Skills

| | | | |
|---|---|---|---|
| HTML | ★★★★★ | python | ★★★ |
| CSS | ★★★ | c++ | ★★★ |
| javascript | ★★ | java | ★★★★ |

### 3.2 Game Page Snap



# CHAPTER 4

# CONCLUSION

## 4.1 CONCLUSION

At last I want to conclude that the journey of learning web development has been a very enthusiastic and fun loving jouney for me and making my first website to test my skills and theoretical knowledge given to me through this mini-project oppourtunity by the institution has boost my confidence and motivated me to work in web development field for some more time .

## 4.2 FUTURE SCOPE

My web dev. course is ongoing and this is my first Website so it surely requires many modifications and advancements
I do have some great ideas which I'm going to implement after I complete my web dev course to make my website more responsive and professional
Some of the ideas are :-

- Adding a Side Navigation Bar to travel between the pages
- Another thing which I'm thinking is to add one or two more games to my website so when the user in case visit my website he can choose if he wants to play the following games
- I'm also thinking of taking ideas from users in the form of feedback/contact form
  So that they can contact me if they have any other idea that can add into my website.
- In near future I will add some new features and will increase the difficulty of the game , and instead of opponent as an AI , it would be much better if it is a multiplayer game where we have another player in front of us.

# APPENDIX

# Code

### ******HTML FILE******

**My_project.html**

```
<!DOCTYPE html>
<html>
    <head>
        <title>My Testing Project</title>
        <meta charset="utf-8">

        <link rel="stylesheet" href="CSS/styles.css">
    </head>

    <body>
        <table>
            <tr>
                <td>
                    <img src="pic.png" alt="profile pic" title="Rish
abh Negi"
width="250" height="250">
                </td>
                <td>
                    <h1>RISHABH NEGI</h1>
                     <p>

                        <strong>
                            Student of department of CSE<br>
                            Graphic era University<br>
                            2<sup>nd</sup> Year &nbsp; (4<sup>th</su
p>sem)</q>
                        </strong>
                    </p>
                </td>
            </tr>
        </table>
        <hr>
        <h3>About Myself</h3>
        <p>
            My name is Rishabh Negi ,call me <strong><em>Rishi</em><
/strong>,
            <br>
            I'm an introvert,but i love spending time with friends
            <br>
            A cup of coffee in rainy season is a feeling of love ♡
            <br>
            <br>


My<strong>objective</strong> here is to just test My skills of web
dev.
            <br>
            let's play a <a href="C:\Users\Rishabh\Desktop\My projec
t\ping_pong.html" target="_blank">
                <strong>Game</strong></a>
            <br>
        </p>
        <br>
        <hr>
        <br>
        <h3>Goal </h3>
        <p>
            Wannabe <em>Senior</em> software developer<br>
            Wnnabe <em>Web developer</em><br>
            Honestly still exploring<br>
        </p>
        <br>
        <hr>
      <br>
       <h3><b>Research Interests</b></h3>
       <p>
           cognitive sciences<br>
           Psychology<br>
           Neuroscience<br>
           machine leaning & AI<br>
           Astrophysicist<br>
       </p>
       <br>
       <hr>
       <br>
       <h3> Skills</h3>
       <table  class="center">
           <tr>
               <td>
                   <table cellspacing="5">
                       <tr>
                          <td>HTML</td>
                          <td>☆☆☆☆☆</td>
                       </tr>
                       <tr>
                          <td>CSS</td>
                          <td>☆☆☆</td>
                       </tr>
                       <tr>
                          <td>javascript</td>
                          <td>☆☆</td>
                       </tr>
                    </table>
               </td>
               <td>
                   <table cellspacing="5">
                      <tr>
                          <td>python</td>
                          <td>☆☆☆</td>
                       </tr>
                       <tr>
                          <td>c++</td>
                          <td>☆☆☆</td>
                       </tr>
                       <tr>
                          <td>java</td>
                          <td>☆☆☆☆</td>
                       </tr>
                   </table>
               </td>
           </tr>
       </table>

       <hr>
    </body>
</html>
```

**********CSS FILE**********

**styles.css**

```
body{

    background-color: lavenderblush;
}
hr{
   border-style: dotted none none none;
   background-color: white;
   height: 0px;
   width: 7%;
   border-width: 0.1cm;
   border-color: slategray;
}
h1,h3{
    color: #66BFBF;
    text-align: center;
}
p{
    text-align:center;
}
.center {
    margin-left: auto;
    margin-right: auto;
    width: 30%;"

}
```

## *******HTML FILE*******

### ping_pong.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Ping-Pong game</title>
    <style>
        body{
            background-color: dimgray;
        }
        #pong{
            border: 2px solid #FFF;
            position: absolute;
            margin :auto;
            top:0;
            right:0;
            left:0;
            bottom:0;
        }
    </style>
</head>
<body>
    <canvas id="pong" width="600" height="400"></canvas>
    <script src="ping_pong.js.js"></script>
</body>
</html>
```

## ********JS FILE*******

### ping_pong.js

```
// select canvas element
const canvas = document.getElementById("pong");

// getContext of canvas = methods and properties to draw and do a lot of thing to the canvas
const ctx = canvas.getContext('2d');

// load sounds
let hit = new Audio();
let wall = new Audio();
let userScore = new Audio();
let comScore = new Audio();

hit.src = "sounds/hit.mp3";
wall.src = "sounds/wall.mp3";
```

```
comScore.src = "sounds/comScore.mp3";
userScore.src = "sounds/userScore.mp3";

// Ball object
const ball = {
    x : canvas.width/2,
    y : canvas.height/2,
    radius : 10,
    velocityX : 5,
    velocityY : 5,
    speed : 7,
    color : "WHITE"
}

// User Paddle
const user = {
    x : 0, // left side of canvas
    y : (canvas.height - 100)/2, // -100 the height of paddle
    width : 10,
    height : 100,
    score : 0,
    color : "WHITE"
}

// COM Paddle
const com = {
    x : canvas.width - 10, // - width of paddle
    y : (canvas.height - 100)/2, // -100 the height of paddle
    width : 10,
    height : 100,
    score : 0,
    color : "WHITE"
}

// NET
const net = {
    x : (canvas.width - 2)/2,
    y : 0,
    height : 10,
    width : 2,
    color : "WHITE"
}

// draw a rectangle, will be used to draw paddles
function drawRect(x, y, w, h, color){
    ctx.fillStyle = color;
    ctx.fillRect(x, y, w, h);
}
```

```
// draw circle, will be used to draw the ball
function drawArc(x, y, r, color){
    ctx.fillStyle = color;
    ctx.beginPath();
    ctx.arc(x,y,r,0,Math.PI*2,true);
    ctx.closePath();
    ctx.fill();
}

// listening to the mouse
canvas.addEventListener("mousemove", getMousePos);

function getMousePos(evt){
    let rect = canvas.getBoundingClientRect();

    user.y = evt.clientY - rect.top - user.height/2;
}

// when COM or USER scores, we reset the ball
function resetBall(){
    ball.x = canvas.width/2;
    ball.y = canvas.height/2;
    ball.velocityX = -ball.velocityX;
    ball.speed = 7;
}

// draw the net
function drawNet(){
    for(let i = 0; i <= canvas.height; i+=15){
        drawRect(net.x, net.y + i, net.width, net.height, net.color);
    }
}

// draw text
function drawText(text,x,y){
    ctx.fillStyle = "#FFF";
    ctx.font = "75px fantasy";
    ctx.fillText(text, x, y);
}

// collision detection
function collision(b,p){
    p.top = p.y;
    p.bottom = p.y + p.height;
    p.left = p.x;
    p.right = p.x + p.width;
    b.top = b.y - b.radius;
    b.bottom = b.y + b.radius;
    b.left = b.x - b.radius;
    b.right = b.x + b.radius;

    return p.left < b.right && p.top < b.bottom && p.right > b.left && p.bottom > b.top;
}

// update function, the function that does all calculations
function update(){

    if( ball.x - ball.radius < 0 ){
        com.score++;
        comScore.play();
        resetBall();
    }else if( ball.x + ball.radius > canvas.width){
        user.score++;
        userScore.play();
        resetBall();
    }

    // the ball has a velocity
    ball.x += ball.velocityX;
    ball.y += ball.velocityY;

    // computer plays for itself, and we must be able to beat it
    // simple AI
    com.y += ((ball.y - (com.y + com.height/2)))*0.1;

    // when the ball collides with bottom and top walls we inverse the y velocity.
    if(ball.y - ball.radius < 0 || ball.y + ball.radius > canvas.height){
        ball.velocityY = -ball.velocityY;
        wall.play();
    }

    // we check if the paddle hit the user or the com paddle
    let player = (ball.x + ball.radius < canvas.width/2) ? user : com;

    // if the ball hits a paddle
    if(collision(ball,player)){
        // play sound
        hit.play();
        // we check where the ball hits the paddle
        let collidePoint = (ball.y - (player.y + player.height/2));
        // normalize the value of collidePoint, we need to get numbers between -1 and 1.
        // -player.height/2 < collide Point < player.height/2
        collidePoint = collidePoint / (player.height/2);
        let angleRad = (Math.PI/4) * collidePoint;

        // change the X and Y velocity direction
        let direction = (ball.x + ball.radius < canvas.width/2) ? 1 : -1;
        ball.velocityX = direction * ball.speed * Math.cos(angleRad);
        ball.velocityY = ball.speed * Math.sin(angleRad);

        // speed up the ball everytime a paddle hits it.
        ball.speed += 0.1;
    }
}

// render function, the function that does al the drawing
function render(){

    // clear the canvas
    drawRect(0, 0, canvas.width, canvas.height, "#000");

    // draw the user score to the left
    drawText(user.score,canvas.width/4,canvas.height/5);

    // draw the COM score to the right
    drawText(com.score,3*canvas.width/4,canvas.height/5);

    // draw the net
    drawNet();

    // draw the user's paddle
    drawRect(user.x, user.y, user.width, user.height, user.color);

    // draw the COM's paddle
    drawRect(com.x, com.y, com.width, com.height, com.color);

    // draw the ball
    drawArc(ball.x, ball.y, ball.radius, ball.color);
}
function game(){
    update();
    render();
}
// number of frames per second
let framePerSecond = 50;

//call the game function 50 times every 1 Sec
let loop = setInterval(game,1000/framePerSecond);
```

# REFERENCE

1. HTML & CSS design and build websites by Jon Duckett
2. Javascript and JQuery interactive front-end development by Jon Duckett
3. The complete Web Developmemt Bootcamp by Angela Lu (Udemy course)
4. MDN web docs by Mozilla